



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,745	10/29/2003	Shinichi Koriyama	81716.0112	6317
26021	7590	06/13/2005		
HOGAN & HARTSON L.L.P. 500 S. GRAND AVENUE SUITE 1900 LOS ANGELES, CA 90071-2611			EXAMINER TAKAOKA, DEAN O	
			ART UNIT	PAPER NUMBER
			2817	

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/696,745

Applicant(s)

KORIYAMA, SHINICHI

Examiner

Dean O. Takaoka

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 4,5,11,12 and 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,6-10,13 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner..
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/17/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election with traverse of Species II, Figures 2A to 2C in the reply filed on March 15, 2005 is acknowledged. The traversal is on the ground(s) that Claims 1 to 14 read on the elected species.

Regarding claims 1 and 7, the Examiner agrees that claim 1 is generic and is readable on Species II. The Examiner further acknowledges claim 7 has been amended and agrees claim 7 is now readable on elected Species II.

Regarding claims 2 – 6 and 7 – 14, Applicant's arguments are not found persuasive because it is the position of the Examiner that claims 4, 5, 11, and 12 read on non-elected Species VII and VIII which are drawn to Figures 8A and 8B. In particular, claims 4 and 11 recite "a distance between the tip and the slot is approximately  $(2n-1)/4$ ...", which is drawn to non-elected Species VII where Fig. 8A clearly shows the distance between the tip and the slot being  $(2n-1)/4$ . Claims 5 and 12 recite "the distance between the tip and the slot is approximately  $(n-1)/2$ ...", which are drawn to non-elected Species VIII where Fig. 8B clearly shows the distance between the tip and the slot being  $(n-1)/2$ , the slot shown in Fig. 2A as reference number 45 and in Figs. 8A – 8C as reference number 75. The tip is denoted by the claimed distance and extending from the end of the slot but where no tip appears to be shown in Figs. 2A – 2C, thus it is the position of the Examiner that claims 4, 5, 11, and 12 do not read on elected Species II and only claims 1 – 3, 6 – 10, 13 and 14 will be considered for examination.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "a thickness of the dielectric layer is approximately  $(2n-1)/4$ " (claim 3), and "a distance between the internal ground conductor layer and the opening of the waveguide is approximately  $(2n-1)/4$ " (claim 8) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 3, 6 – 10, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchimura et al. (U.S. Patent No. 6,239,669) in view of Koriyama et al. (U.S. Patent No. 6,239,669), prior art submitted in Applicant's IDS dated May 17, 2003.

Claim 1:

Uchimura et al. shows a high frequency line to waveguide converter comprising a high frequency line including a dielectric layer (1) (comprising dielectric layers 1a-1c – Fig. 1), a line conductor (51, 80, 85 et al. – Fig. 5, 8 – 10, 11) disposed on one surface of the dielectric layer, and a ground conductor layer (2) disposed on the same surface (Fig. 5 where 51 and 2 are on the same surface) so as to surround one end of the line conductor (where Figs. 5, 16, 17 shows ground layer 2 surrounding the line conductor), a slot (90 – Fig. 16) formed in the ground conductor layer so as to be substantially orthogonal to the one end of the line conductor and coupled to the high frequency line (where Figs. 16 and 17 show orthogonal slot 90); a shield conductor part (4) disposed on a side or inside of the dielectric layer; and a waveguide (defined as transmission line 5; where transmission line 5 is a waveguide demarcated by vias 4 – Fig. 14) disposed on a side of the other surface of the dielectric layer so that an opening (90 – Fig. 14) is opposite to the one end of the line conductor and the slot, and electrically

connected to the shield conductor part but does not show the shield conductor part disposed on a side or in an inside of the dielectric layer so as to surround the one end of the line conductor and the slot (where Uchimura et al. shows the shield conductors on the front and back of the line conductor and slot).

Koriyama et al. shows a similar a high frequency line to waveguide converter comprising a line conductor, ground, shield conductors, slot and waveguide where the shield conductor part disposed on a side or in an inside of the dielectric layer so as to surround the one end of the line conductor and the slot (Figs. 21A – C).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the shield conductor arrangement disclosed by Uchimura et al. with the shield conductor part surrounding one end of the line conductor and the slot disclosed by Koriyama et al. Such a modification would have realized the advantageous benefit of providing pseudo-conductor walls for an orthogonal transmission line (such as shown in Fig. 2 – Uchimura et al.); where Uchimura et al. teaches the shape of the transmission line being rectangular but may be other various shapes (col. 8, lines 3-6); and where both Uchimura et al. and Koriyama et al. are of the same Assignee, thus suggesting the obviousness of the modification.

Claim 2:

Where the shield conductor part includes a plurality of shield through conductors disposed in the inside of the dielectric layer (Uchimura et al. 4 – Figs. 1, 8 and 11 – 17; and Koriyama et al. 71 – Figs. 21A – C).

Claim 3:

Where a thickness of the dielectric layer is approximately  $(2n-1)/4$  of a wavelength of a signal transmitted through the high frequency line (col. 5, lines 3-6; where Uchimura et al. teaches the distance between sub conductive layer 6 and conductive layers 2 or 3 being  $1/4\lambda$ , thus the thickness of the dielectric layer between conductive layers also being  $\lambda/4$  or in the case of multiple layers, where each layer is  $\lambda/4$  or approximately  $(2n-1)/4$ ).

Claim 6:

A second dielectric layer laminated on the dielectric layer on which the line conductor is disposed (where Uchimura et al. shows multiple layers; where lamination is a process and in the case of product claims, only the final product is patentable where the multiple dielectric layers of Uchimura et al. would obviously be made by lamination or any other equivalent means); and one surface ground conductor layer provided on one surface of the second dielectric layer (where Uchimura et al. shows multiple ground layers 6 – Figs. 8 and 14).

Claim 7:

An internal ground conductor layer (6 – Figs. 8 and 14; Uchimura et al.) disposed in the inside of the dielectric layer between the ground conductor layer and the waveguide and having a transmission opening for causing an electromagnetic wave of a signal transmitted through the high frequency line to be transmitted between the slot (90 – Fig. 14) and the waveguide (col. 12, lines 33-67; where TE<sub>10</sub> mode waves are propagated; Uchimura et al.).

Claim 8:

Where a distance of between the internal ground conductor layer and the opening of the waveguide is approximately  $(2n-1)/4$  of a wavelength of an electromagnetic wave of a signal transmitted through the high frequency line (where the dielectric layers such as 1a-c are each  $\lambda/4$ , discussed in the reasons for rejection of claim 3 above and where Uchimura et al. further shows multiple ground layers and slot in Fig. 14, thus the dielectric layer or distance of between the internal ground conductor layer and the opening of the waveguide of Uchimura et al. obviously being approximately  $(2n-1)/4$  of a wavelength).

Claim 9:

Where an area of the transmission opening is half or less of an area of a region surrounded by the shield conductor part (where Uchimura et al. shows in Figs. 14 – 16 the area of the slot being half or less of an area of a region surrounded by the shield conductor part 4).

Claim 10:

Where the shield conductor part includes a plurality of shield through conductors disposed in the inside of the dielectric layer (where Uchimura et al. 4; and Koriyama et al. 71 both show multiple internal shield conductors).

Claim 13:

Where the ground conductor layer and the internal ground conductor layer are connected by a connection conductor disposed to pass through the dielectric layer along the transmission opening (where Uchimura et al. shows grounds 6' and 6 are



connected by shield conductors 4 – Fig. 8 in a similar manner as shown in the present invention).

Claim 14:

A second dielectric layer laminated on the dielectric layer on which the line conductor is disposed (where Uchimura et al. shows multiple layers – Fig. 8 and where the process of lamination in a product claim is discussed in the reasons for rejection of claim 6 above); and one surface ground conductor layer provided on one surface of the second dielectric layer (where Uchimura et al shows surface ground layers – Fig. 12), where the high frequency line is constructed as a coplanar line structure having a ground (where Uchimura et al shows the laminated waveguide comprising layers 2, 3, 5, 6 – Fig. 1 being coplanar).

**Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dawn et al. – shows a transmission line to waveguide device.

Iizuka et al. – shows a waveguide transmission line device.

Matsuzuka et al. – shows a high frequency circuit device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

Art Unit: 2817

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



dot  
May 27, 2005